



INTERNAL CORRESPONDENCE

UNION CARBIDE NUCLEAR COMPANY

POST OFFICE BOX P, OAK RIDGE, TENNESSEE

To: ORGDP Criticality Hazards Committee: Date September 8, 1961

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Mr. J. Dykstra	Mr. J. A. Parsons	Answering letter date
Dr. G. A. Garrett	Mr. W. L. Richardson	
Mr. A. P. Huber	Mr. M. F. Schwenn	Subject
Mr. K. M. Jones	Mr. J. B. Scott	Purge Gas Trap Facility - K-312-1
Mr. D. M. Lang		KR-165

Copy To:

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Plant Records

Nuclear safety considerations were given to the installation of a purge gas trap facility in K-312-1.¹ The new facility will use sodium fluoride,² an improved UF₆ absorbent material, as the trap charge in eight 5 in. I.D. x 6-1/2 ft. traps. A similar set of 12 alumina traps will also be provided for use if needed.

Equipment and Operation

The sodium fluoride traps will be enclosed in electrically heated housings each containing four traps and controlled at a minimum temperature of 200°F; the alumina traps will be unheated. Purge gases from the sodium fluoride and the alumina traps will be evacuated by 100 psig. air ejectors to the existing 10 in. I.D. exhaust stack and blower systems in K-312-1 and K-312-2, respectively. Cascade piping will be essentially unchanged, and will continue to permit operation of either or both the K-312-1 and the K-312-3 tops purge units with the purge gas traps. However, the K-312-2 cold trap facility, which is in stand-by,³ will also connect to the K-312-1 purge gas traps.

- 1 Letter from K. M. Jones to H. F. Henry, Request for Nuclear Safety Approval for Purge Gas Trap Facility in K-312-1, August 8, 1961.
- 2 Cathers, G. I., Bennett, M. R., and Jolley, R. L., The Fused Salt-Fluoride Volatility Process for Recovering Uranium, April 15, 1959 (ORNL-2661).
- 3 Henry, H. F., Cascade Cold Trap Facilities - Nuclear Safety Summary - Revision No. 3, September 15, 1958 (KSA-143).

This document has been approved for release
to the public

for Asst. Dir. *[Signature]*
Technical Information Officer
Oak Ridge K-25 Site

Date

Union Carbide Nuclear Company, Oak Ridge
Gaseous Diffusion Plant, Operating Contractor
for the U.S. Atomic Energy Commission.

A space recorder will continuously monitor the discharge gases of the K-312-1 purge gas traps and, at a maximum concentration of 6 ppm. UF_6 , will actuate audible and visual alarms both in the K-305-9 control area and in the K-303-7 Central Control Room. If necessary, purge flows will be stopped by either control center or by local operations at the K-312-1 purge facility.

Nuclear Safety

Although the 10 in. I.D. exhaust stacks and blowers in K-312-1 and 2 were considered to be the principal items of nuclear concern, it appears unlikely, in view of the close operational controls noted, that a significant amount of uranium would ever accumulate in this equipment. Further, radiation surveys will be continued, both at weekly intervals and in the event of abnormal purging operations, and it may be noted that the exhaust stacks are constructed in 6 ft. flanged sections for ease of inspection. This is considered to be a desirable feature in the event that disassembly and cleaning of the stacks would ever be necessary.

Spacing of the two groups of geometrically safe 5 in. I.D. x 6-1/2 ft. purge gas traps is considered adequate and well within allowable limits.⁴ Each group of traps is aligned in parallel rows, 12 ft. apart, with each trap spaced 30 inches edge-to-edge, mounted on a special mobile dolly, and equipped with spacer bars to maintain this spacing during trap removal and disposal operations.

Conclusions

The installation and operation of the new K-312-1 purge gas trap facility appears safe as outlined herein. However, in view of the improved adsorption properties of sodium fluoride as compared with other UF_6 adsorbent materials in use at the ORGDP, any additional plant applications should receive further nuclear safety consideration.



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Nuclear Safety Department

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⁴ Henry, H. F., Mallett, A. J., Newlon, C. E., and Pryor, W.A., Criticality Data and Nuclear Safety Guide Applicable to the Oak Ridge Gaseous Diffusion Plant, May 22, 1959 (K-1019, Fifth Revision).